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TSS  
THE FIRST FIVE YEARS

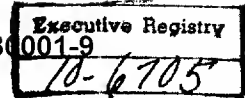
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A Report by

Luis deFlorez  
Chairman, CIA Research Board

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22 April 1957

MEMORANDUM FOR: DIRECTOR, CENTRAL INTELLIGENCE

SUBJECT : Technical Services Staff

1. I submit herewith a review of the activities and development of TSS over the past five years. This takes the form of a brief review of over-all policy and program, a condensed progress report covering the several Divisions and certain tabulated data on personnel, money and facilities. On the whole I believe you will agree that a record of solid accomplishment has been established during the period.

2. Shortage of technical and scientific manpower has been the root of most of our difficulties rather than shortage of funds. Under present conditions in industry, any Government Agency finds itself in a difficult position in bidding for scientific talent. Inflated salaries and "fringe" benefits are presently being offered to today's engineering and science graduates at all levels from BS's to PhD's. Then too, the complicated and lengthy employment and clearance procedures to which recruits are exposed act as a great deterrent to many who might otherwise be interested. There is no simple solution to this problem. We must everlastingly keep after likely candidates and be willing to expand the staff to meet the growing task of keeping up with scientific progress. We should not, therefore, be unnecessarily hampered in our efforts by too rigid T/O restrictions. Too much time and effort appear to be wasted in the complicated procedures now necessary. To offset this difficulty, we have resorted to the employment of scientific talent through contract which has great merit.

3. We must realize, however, that as a result of expanding requirements and limited manpower, the research worker - no matter how competent - must spread his effort too thinly. There is a limit to the number of research projects that can be effectively monitored by one man. Recent studies in this area indicate that TSS project engineers are trying to supervise about twice as many

projects each as is the general average for comparable work in industry, or, in fact, in other Government Agencies. With the "leverage" available through our contract operations, however, a considerable increase in over-all capability over present levels may be realized.

4. On the financial side, it is the responsibility of Chief/TSS to convert dollars effectively into useful results. In research activities it is seldom possible to come up with a tangible result to match every dollar and cent expended. The long-range results are the most important. The ultimate payoff may not be discernable in this year's balance sheet. Current results are coming from monies appropriated 2-3 years ago.

5. The Research Board which has been essential as a basic component of the research organization has had a strong influence on the operation of TSS and has been valuable in maintaining basic principles and original operational policies. More use could and should be made of the Board, both as a group and individually.

6. The existence of this Board is as important an asset to the Agency as its counterpart, the Naval Research Advisory Council, is to the Navy. It provides advice and policy guidance to TSS and reviews its work periodically, particularly in research. In the future, it should not be necessary for the Chairman to take such an active part in the actual operations of TSS. He should, however, serve as the point of contact or liaison between the Agency and the members of the Board. This will reduce the necessity of frequent meetings which might limit the availability of desirable members.

7. Through TSS and its connections, a tremendous scientific potential is now available to the Agency. It can continue as a service organization and it can continue to develop and improve equipment to satisfy field requirements, thus serving a very useful purpose. Its real potential will not be fully developed, however, until every component of the Agency is fully aware of the potentials and the limitations of the highly sophisticated equipment and techniques with which it deals. The closest possible interchange must be maintained between TSS and the operating divisions.

8. The mechanism now exists within TSS to initiate and foster research at the highest level in this country. This capability cannot be exploited effectively, however, unless it is energized by firsthand knowledge of long-range policies and aims. This can

come only from intimate and continued contact with the Agency's policymakers. The Chief/TSS should be included in top Agency planning.

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9. Great credit should go to the people who made TSS what it is today. [ ] did much with the meager facilities that were originally available. [ ] and his present staff have, in the face of many handicaps, brought the organization to a point of high current and future potential productivity.

10. TSS capabilities should be more widely recognized and more fully exploited by the Agency as a whole for it now contains adequate scientific talent of its own and has almost unlimited scientific potential through its consultants and contractors. The work of the past five years has created a valuable asset which should not be warped by misuse or lost by neglect.

11. May I take this opportunity to express my sincere appreciation of your constant interest and assistance from the very beginning. Without your steadfast belief in the need for harnessing science and technology to meet the growing problems of the Agency, this work would not have been possible.

  
LUIS deFLOREZ  
Research Chairman

Attachment: (1)  
Five-year Review of TSS

TSS  
THE FIRST FIVE YEARS  
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A Report by  
Luis deFlorez  
Chairman, CIA Research Board

TSS - THE FIRST FIVE YEARS

TSS was formed in 1952 by combining OAD/OSO and RD/OPC. Its original complement of [ ] was composed mainly of technicians and field operatives with only a handful of scientifically trained people. It had virtually no facilities and no funds of its own. It had no long-range research and development programs. It operated on an ad hoc basis largely to improve the "blow and burn" techniques and equipment inherited from OSS days.

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In contrast after 5 years of development, TSS has built a solid foundation - comprising:

1. A staff of [ ] dedicated professional people (at home and abroad) whose talents cover almost every technical and scientific field, backed up by a remarkable group of technical advisors and consultants having entrée into practically every university and industrial research laboratory in the country.
2. Facilities for research, development and testing virtually in any scientific field, either within its own R&D Divisions or under contractual arrangements with industry.
3. An efficient organization in its Authentication and Technical Aids components to support the most sophisticated Agency operations anywhere in the world. Disguise techniques, document duplication, surreptitious entry and audio and photo surveillance are their stock in trade.
4. Working relations for joint research, experiment and test with the Armed Services and with other Government Agencies.

Today, TSS is geared to shift the emphasis and direction of its activities to meet the ever changing concepts of intelligence collection and the unpredictable requirements of the Cold War. The rapidity and scope of changes which are occurring in the world today demand a flexible technical organization to follow the subsequent shift in the programs of the Agency. The recent

changes in direction of research and development from covert warfare to new methods of intelligence collection have demonstrated its flexibility. TSS can empanel scientists and technicians to work on almost any kind of project. It has an extensive list of equipment and techniques "on the shelf", ready for use as required. It can thus provide special equipment and trained personnel to support Agency operations any time, any place. It has become a powerful, flexible and effective tool.

It is not, however, a perfect tool. TSS has often been frustrated by inability to secure and to hold desirable personnel under existing Government regulations and under Agency restrictions. Many of those handicaps have been overcome. Some still exist. After five years of operation, however, the basic concepts have changed very little. They have been modified in detail from time to time to meet varying situations, but, on the whole, they have proved to be sound and workable.

The original concept of providing a technical division for the Agency envisaged an organization combining a research and development staff of adequate size to meet world competition with certain operational functions to carry into the field the results of scientific and technological advances and obtain experience.



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In view of the urgent need for new tools and technical aid, much of the initial effort of TSS has been devoted to service and development. The research effort has grown slowly due to limitations in scientific staff caused chiefly by personnel ceilings which were imposed before completing the organization, the effects of which still continue.

Today about 20% of the manpower of TSS is devoted to research and development which should be increased by addition to the scientific staff. Nevertheless, this relatively small staff

is effectively directing and administering an important research program in conjunction with contractors, Government Agencies and the Armed Services, actually converting about two-thirds of the TSS budget into scientific work. Although the individual members of the staff are at or near the limit of their capability in monitoring projects, additional research capacity is still available in certain areas which can be handled by existing contractors where the work is an extension of existing projects.

Certain basic principles were laid down when the original TSS charter was written. They are still sound. They have been adhered to during the past five years.

1. TSS has the prerogative to initiate and to carry out research in any field of science and technology.

This promotes freedom of thought and tends to create initiative and stimulate imagination. Administratively it avoids crippling jurisdictional disputes.

2. TSS does not assume control and is not made responsible for research in any other part of the Agency.

This, in combination with 1, places responsibility for results on the basis of merit rather than franchise. In research, duplication does not exist as such. Parallel effort which may occur fosters competition and action which in turn tend to generate quality.

3. TSS is given a yearly budget of its own to cover the program of technical activities submitted by Chief/TSS.

This is necessary to plan and program the work efficiently and to center the responsibility for results. Planning is one of the primary functions of a director of research. He should have the benefit, as he does now, of advice from his scientific advisors, associates and Agency divisions; but, in the last analysis, he must assume the responsibility and be given the necessary authority to select and to proportion the technical effort as a whole. Competent research and development stems from the personal



attainments and leadership of the research director rather than any administrative procedures or regulation. He must combine good judgment with scientific talent if he is to receive the co-operation and support necessary to carry out his mission.

4. TSS should be responsible for its own personnel overseas insofar as assignments, training and careers are concerned, as is now provided.

This concept added at a later date permits rotating personnel from Headquarters to the field to carry new technical knowledge to operating areas and to bring back firsthand operational knowledge and experience to the scientific and technical divisions. This exchange so essential to the utilization of the technical effort was delayed for a long time but is now in full operation and beginning to bear fruit.

TSS has been patterned to a large extent after the Navy's ONR. It resembles ONR in its basic philosophy and principles, but it necessarily differs in the nature of its scientific aims and its responsibilities. Whereas ONR is essentially a research organization relying in the main on the Bureaus for development of proven discovery, TSS must carry its ideas to some practical application since there exists no other comparable facility in the Agency, with the possible exception of COMMO, with which TSS maintains close contact.

The need for carrying the selected yield of research to a useable stage make it necessary for such an organization to have some hand in operations and training to carry new knowledge to the field and promote practical thinking. The co-existence of the three functions of research, development and field operation is not illogical. In fact, this pattern has advantages, provided these functions are wisely proportioned and kept so by careful direction and freedom from administrative pressures.

Research which is of the essence as the basic long-range factor for successful and objective development must not be crowded out by requirements in the face of restrictions on scientific personnel and funds. Such tendency must be resisted and guarded against. Otherwise the quality of results will gradually sink to hopeless mediocrity. This relationship and structure

has been evolved within TSS. The task of the future is to insure a balanced effort.

The Research Board (Chart I) was created to provide an advisory body whose members covered a wide range of scientific knowledge. This Board is intended to serve not only as scientific advisors to TSS but also to the Director and all the Agency, both as a group and as individuals. In view of the pre-eminence and the commitments of the individual members of such a board, it is impractical to hold meetings more than two or three times a year. This handicap is overcome, however, by having the Chairman take the responsibility of keeping in touch with individual members to keep them up to date on TSS activities and to obtain advice and guidance at frequent intervals. Conversely, the Chairman through his direct contact with the DCI can keep the individual members of the Board advised of Agency problems and aims to stimulate their continued interest.

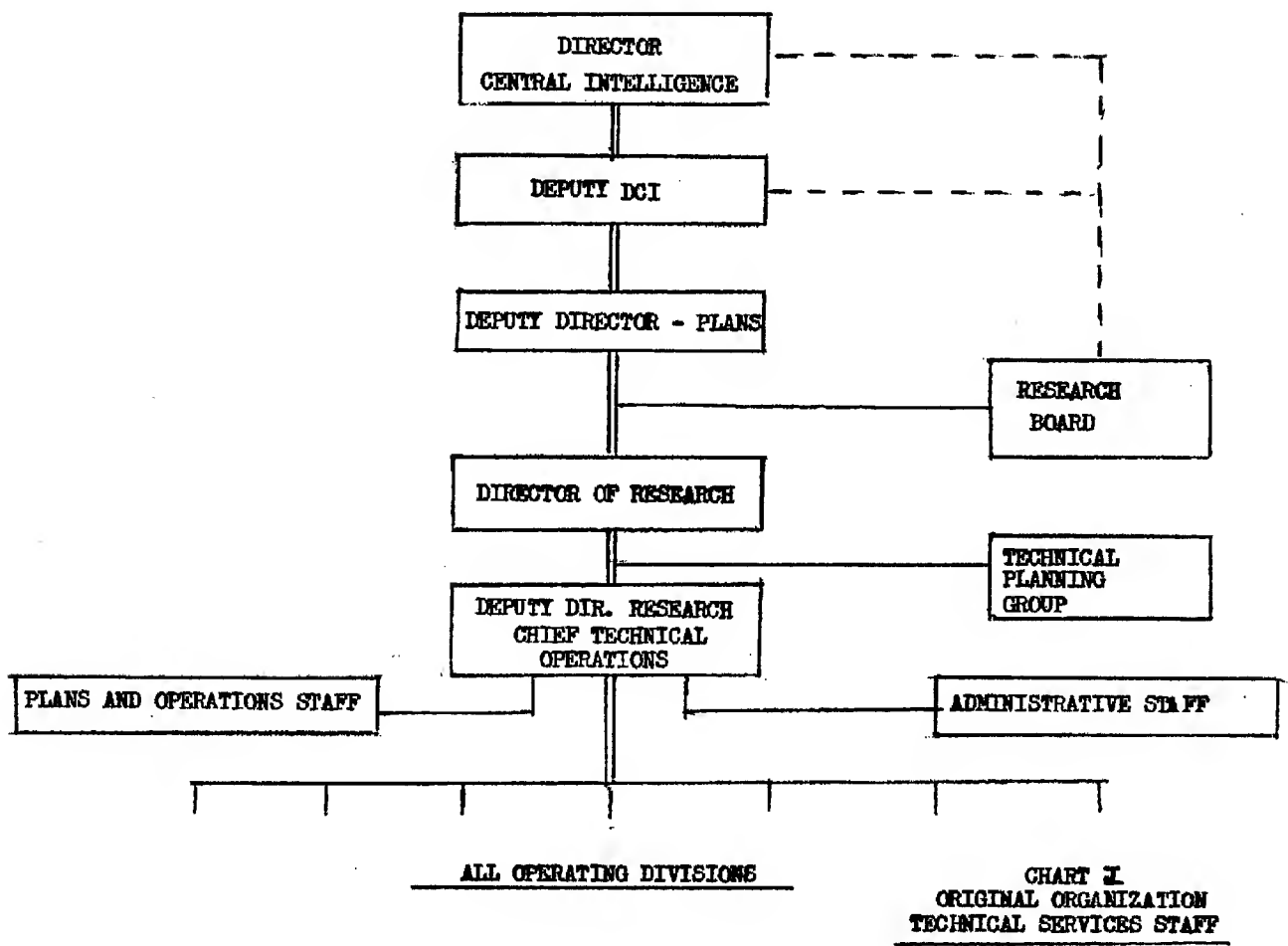
Chart I shows the relationship of the several TSS components to the Agency and also the internal set-up of TSS as originally conceived. Early in 1955 the operating divisions of TSS (which until then had reported directly to Chief/TSS) were regrouped under three Assistant Chiefs, i. e., Authentication, Technical Aids and Research and Development. This remanagement, which is now in effect, is shown on Chart II.

Following the two organization charts is a series of tables which serve to point up certain significant elements in TSS growth. Tables I and II have to do with personnel - showing growth in numbers in various categories, and technical competence in terms of degrees held. Table III lists the scientific and technical advisors to TSS and their assignments. Table IV has been included to illustrate the extent to which research and development is being "farmed out" to qualified contractors. It is from these sources the considerable "leverage" is obtained to multiply the capabilities of TSS scientific personnel. Finally, Table V gives an indication of the amount and distribution of the funds made available to TSS by the Agency.

Following the Charts and Tables are brief summaries of the three principal TSS components - Authentication, Technical Aids and Research and Development.

CHART I

Original organization of the Technical Services Staff  
showing relationship to other Agency components.  
Note that all TSS operating divisions reported directly  
to Chief/TSS.



MEMBERSHIP - CIA RESEARCH BOARD

RADM Luis deFlorez, Chairman

RADM Rawson Bennett, USN  
Chief of Naval Research

RADM C. M. Bolster, USN (Ret.)  
General Tire & Rubber Company

Dr. Leonard Carmichael  
Secretary, Smithsonian Institution

Dr. Jerome C. Hunsaker  
NACA and MIT

Dr. Edwin H. Land  
President, Polaroid Corporation

Dr. C. Guy Suits  
Director of Research, General Electric Company

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CHART II

Present organization of TSS. Note that the technical divisions have been regrouped under separate heads.

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TABLE I  
TSS PERSONNEL GROWTH

The problem of securing competent and experienced technical men and scientists has been a major problem since the inception of TSS. Competition from industry and scientific foundations and the necessary need for secrecy have been major adverse factors.

We have tried to overcome this with some success by recruiting young technical graduates directly from college with the idea that a reasonable proportion of these would become interested in the work and continue with the Agency. Thus, we might develop talent which we could not attract from other sources later. About a quarter of such men have stayed on, and useful relations maintained with a number who have been released to industry.

In spite of the attrition, I believe this is a valuable source of good technical men and a possible source of genius. It should be continued from year to year as a matter of routine.

We have had very little success in securing high grade mature technical personnel except as an occasional transfer from other Government services and from the group of men retired from industry. Retired Service personnel are loath to take other Government jobs in view of conflict with their pension which virtually eliminates this category.

Securing experienced individuals is, and will continue to be, a matter of personal search and persuasion. We should, however, be prepared to make room for such individuals when available; otherwise, they will probably be lost along with the effort and time spent in attracting them.

Needless to say, the greatest factor in improving the effectiveness of TSS, or, for that matter, the Agency as a whole, is the ability to secure able individuals. I cannot stress too highly the need for individual effort and flexibility in order to facilitate this activity.



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TABLE II  
EDUCATIONAL BACKGROUND - TSS PERSONNEL

The success of the recruiting program is illustrated by this study of the degrees held by TSS personnel. Over 40 per cent of the total are BA's or better.

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TABLE III  
TSS TECHNICAL ADVISORS

List of individual consultants currently advising  
TSS.

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TABLE IV  
TSS CONTRACTORS

The volume of TSS business with its 60-odd contractors gives an indication of the degree of assistance rendered by "outside" sources.

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TABLE V  
TSS BUDGET GROWTH

The budget figures from year to year are a rough indication of growth of TSS activities. They should not be construed merely in the light of expenditures, but rather as the increasing capability of TSS to convert dollars into technical accomplishment.



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TABLE VI  
TSS FACILITIES - FIVE-YEAR GROWTH

This Table shows the increase in space occupied by typical TSS functions over a five-year period.

Headquarters with a number of activities was moved to the reconstructed fire-proof [ ]

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The space of [ ] was expanded to comprise the whole basement of the Central Building with necessary air conditioning

The Technical Services Laboratory was moved from the building at [ ] loaned by Naval Ordnance to a new laboratory erected at [ ]

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The Secret Writing Laboratory was moved from the Central Building basement to a well-equipped laboratory on the top floor of the Administration Building

The storage warehousing was expanded in rented space at [ ]

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It must be borne in mind that although the expansion and character of space allocated constitute a major improvement, TSS facilities are rather widespread for efficient management. Also there still remains the problem of moving [ ] to a suitable location.

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CHARTS III and IV

These curves give a graphic representation of the increase in the R&D projects underway and completed, together with an indication of the personnel available and the average workload per man.

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REPORTS ON CURRENT PROJECTS & WORK

A list of current R&D projects is available through the periodic reports prepared by the Assistant Chief for R&D summarizing the work in various field, such as Audio Surveillance, Photography, Automatic Intelligence Collection, etc.

Other Divisions of TSS also report their current work in the form of monthly and quarterly reports.

All of these data are available on request but are too voluminous to be included in this report as such.